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ETHICS AND THE WEATHER

BY

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ETHICS AND THE WEATHER.

THE problem of human conduct, as far as the individual is concerned, is perhaps no nearer a solution to-day than it was in the time of the Sophists. Certainly no one has been able to formulate a law from which can be predicted what A and B and C will do, under given conditions, for each is sure to react to them, in his own peculiar manner; still it is safe to say that the conditions are becoming more and more subjects of study. Yet, however hopeless may be the enigma of the conduct of the individual, that of the mass does not present quite so many difficulties. In human nature there are enough characteristics common to all, to form a working basis, and certain laws of conduct may be formulated for a people even though they lose their validity when applied to the individual. So-called "Racial Traits" are but the observed effects of such laws, and are generally based upon the influence of some condition of the environment, not infrequently the climate, upon the people. The fact that they are not true for every individual does not invalidate them for the race, nor lessen their weight in the prediction of the conduct of the mass under given conditions.

. Problems in the ethics of the mass are, however, by their necessities limited in number. Only those may be studied which furnish adequate data of conduct and in which the condition that is supposed to influence behavior is constant for all, or varies simultaneously for all, if the effects of changes in the condition are to be noted. The influence of bad breakfasts upon the conduct of a people, however potent an ethical factor they may be, could not well form the basis of a statistical study, for the reason that we have no means of knowing how many people, on a given day, were suffering from them. On a morning when A's emotional equilibrium had been ruffled by poor coffee, B's was calm in the enjoyment of a cup of the most savory quality, and with the accidental relations which

bad breakfasts bear to one another in point of time, no regular fluctuations in the occurrence of crime can be attributed to them. Among the problems which can be considered are those of an economic nature, for hard times affect all in a community either directly or indirectly, and these problems have received considerable attention. The influence of periods of financial depression upon the prevalence of suicide and certain other crimes is recognized, and the student of social statistics can predict with a reasonable degree of accuracy the effect of such periods upon the people, as shown by the population of our penal institutions. But aside from widespread economic influences and occasional waves of social or religious enthusiasms, the conditions which can be said to influence conduct, are for the most part peculiar to the individual or to a limited number. The one marked exception to this is the weather.

For any given community of limited area, a change in weather conditions means a change in the environment for every inhabitant. If this change in the environment tends to influence conduct, and any statistics of conduct are kept, their study in connection with the records of the weather would disclose the fact. It is just this problem with which our paper deals. It is an attempt, by empirical methods, to discover the influence of the weather upon human behavior. It has nothing to do with the permanent or racial effect of prevailing meteorological conditions, but with the immediate and temporary effect of definite fluctuations of those conditions. In other words, not of climate but of weather.

That certain phases of the weather have a marked effect upon the emotional states of many people cannot for a moment be doubted. Fiction bases many of its tragic climaxes upon such a belief, and not a few of the world's greatest thinkers have left a record of such recognized effects upon their own mental states. "Weather Wisdom" is based upon such an influence upon the members of the lower animal kingdom. The newspapers not infrequently touch upon it in attempting to account for an epidemic of suicide or some other crime, and the literature of insanity is full of allusions to it. School teachers almost without exception, and all those who are in

charge of individuals in great numbers—as wardens of prisons and penitentiaries—are firm believers in such an influence. Yet most of us do not need the evidence of others to be convinced of its existence; we feel it and make it the scapegoat for all sorts of sins of omission and commission when no other seems conveniently near. The purpose of this paper, then, is not so much to demonstrate *that* such an influence is as *what* it is, both qualitatively and quantitatively.

The method followed is a purely inductive one and consists of a comparison of the average daily occurrence of certain recorded abnormalities of conduct, with their occurrence under definite meteorological conditions. The data of conduct considered were all taken from the records of the New York City Coroner, Chief of Police and Superintendent of Schools, and consisted of the daily record of suicides, both successful and attempted, of arrests for assault and battery and drunkenness, and of deportation in the City Penitentiary and certain of the public schools; in all over 400,000 separate occurrences, covering a period of ten years. The meteorological data for comparison were taken from the records of the New York Station of the United States Weather Bureau and comprise the mean temperature, barometer and humidity, the total movement of the wind, the character of day and the precipitation for each day of the period covered by the data of conduct.

Given, then, facts bearing upon the deportation of the people of New York City for every day for so long a period of time and the exact meteorological condition for each day, by means of a somewhat laborious process of tabulation* it is possible to determine with exactness the weather conditions under which deportation is at its best or worst. In the tabulation, the average daily occurrence for all the days falling under a given meteorological condition was compared with the average daily occurrence for the whole period studied and an excess or deficiency for definite weather conditions noted. This excess or deficiency was ascribed to weather influences. The right to do this might at first thought be questioned, but a brief consideration will, I believe, show its validity. Let us see: We find marked fluctuations in the daily occurrence

of immoral acts in a given community and must believe these fluctuations to be the effects of some cause or causes, since the time is past when the scientific mind can relegate them to the category of chance. The community is large and the immoral acts are distributed throughout its length and breadth, so in searching for possible causes, all those which are narrowly local, in affecting but a few individuals, fail to meet the requirements. A's bad breakfast and B's financial failure and C's love affair then, though all potent in determining the behavior of these individuals on given days, bear but accidental relation to one another in point of time, and in considering 1,500,000 A's and B's and C's for a series of years would fail to be cumulative in effect. There is in fact but one condition in the environment which changes simultaneously for all the individuals considered, and that is the weather.

On *a priori* grounds then we might expect some definite relation between fluctuations in the weather curve, and that of the occurrence of crime; at least such a thing would be not unreasonable. Yet the *onus probandi* must still rest upon the *a posteriori* method. This we have followed, with the result that a fixed relation is found to exist between the prevalence of certain weather states and an increase in the occurrence of crime, which can be considered hardly other than causal. Yet we must define a little more freely the sense in which the weather can be considered the cause of crime. It is not probable that once in ten thousand times is the weather the immediate and exciting cause of any of the misdemeanors we are considering. We cannot for a moment suppose that a low state of barometer ever drove a man to suicide, though we shall see that suicide is three times as prevalent during conditions of low barometer as during high. In all probability every man whose arrest for assault we are to consider had what seemed to him at the time an all-sufficient excuse for the deed which brought him trouble, and the state of the weather was not in any sense a motive. The question

*See "Conduct and the Weather," Monograph Supplement, No. 10, *The Psychological Review*.

is this: Would the provocation which brought about so violent and disastrous a motor reaction under one condition of weather, have produced the same under another? In other words, are some meteorological conditions productive of emotional states during which an impulse to do an immoral act is less likely to be inhibited than during others? We believe the facts stated in this paper prove this to be the case, but even then we must suppose the direct effect of the weather to be physiological and only through influencing the metabolism of the body, psychological.

The relation between body and mind and the interaction of the one upon the other is known to be of such a nature that, given a physiological change, the mental change is sure to follow and the nexus is in every sense causal. For whatever fixed relations we find then between certain weather states and an increase in crime, we must suppose various and varied provocations peculiar to each individual misdeed and accidental to the weather problem, together with prevailing meteorological conditions which so affect the body that emotional states are produced during which such provocations are likely to be yielded to. In stating these relations, which we have perhaps a logical right to ascribe to "weather effects," I would call attention to the fact that averages in daily occurrence are in every case considered, so the fact that for some of the meteorological conditions there were very many more days than for others, and consequently more crimes, does not in any way invalidate the result. Those conditions, however, which occurred so seldom that the probable error from causes accidental to the problem are equal to the indicated influence, are omitted. I shall not attempt by psychological analysis to account for any of the peculiarities shown.

Temperature.—The effects of different degrees of temperature upon the frequency of the acts studied is very marked. At both extremes of heat suicide was found to be excessive: for temperatures below 10° (Fahrenheit), more than three times the normal, and for those between 85° and 90°, 46 per cent. above the average. These facts are, however, not hard to account for, as the actual misery entailed by such conditions

is great. The relation of the temperature curve to the prevalence of assault is interesting. In tabulating 40,000 arrests for this crime, hot days were found to be the ones which make trouble for the police-judge presiding over a fighting precinct, although this statement must be modified, for the mercury may get so high as to leave his prisoners' box nearly empty. For example: on days when the mean temperature was below 50°, arrests for the crime of assault were below the normal in number, in amounts varying from 50 per cent. to 10 per cent.; from that point in daily means, till a temperature of 85° is reached, there is a rapid increase in the number of assaults to an excess of 80 per cent., at which point there is a sudden drop to an excess of 33 per cent. for males and a deficiency of 35 per cent. for females. It would seem that under conditions of great heat there was little energy left for fighting. For drunkenness the conditions are almost exactly reversed. The cold days are here shown to be the saloonkeeper's friends. Arrests for this crime increase as the mercury goes down, and with almost an equal regularity from a deficiency of 40 per cent. for temperatures in the vicinity of 85° to an excess of 38 per cent. for those of 10°. In considering the demerits of more than 100,000 pupils in the public schools we have, in spite of the similarity which seemingly should exist between conditions there and upon the street; a striking difference. For temperature above 70° we find misdeeds below the average in number. To those of us who know the fretfulness of our own children during hot weather this seems inexplicable till we study the conditions. The temperatures made use of in the tabulation are those of the Weather Bureau, while the children are experiencing those of the school room. In the large city school building, these remain cool even on the hottest days, and their contrast with the outside air is undoubtedly sufficiently soothing to account for the lack of disorder. For the penitentiary great heat was found to be disastrous to discipline, a fact which does not speak well for the ventilation.

Barometer.—In the influence of the meteorological condition indicated by this instrument we have one of the most interesting features of the problem. It is in many cases infin-

itely greater than that of heat, although by our senses we cannot ordinarily tell whether atmospheric pressure is great or small. Generally speaking, the crimes which we are considering were excessive when the mercury column was low; this is especially true of suicide. For readings between 29.30 inches and 29.60 inches, which are near the lowest limit for New York City, the average excess was 150 per cent. (two and one-half times normal), while for an inch higher (the upper limit) the deficiency averaged 65 per cent. (one-third normal). For the other data considered in this paper, except drunkenness, the relations were similar though the effects were less marked. For drunkenness (and the death rate which is not here discussed) there were deficiencies shown for low barometrical conditions. For the showing of the barometer curve it is not easy to account except by referring to its relation to storms. The instrument is low for a period just preceding a violent storm, and the peculiar physiological and mental states at such times are well recognized.

Humidity.—Varying degrees of moisture in the atmosphere affect differently the prevalence of the misdemeanors which we are considering. For great humidities (much moisture) suicide and drunkenness and death are excessive, while assaults and disorders in the schools are deficient with the reverse conditions for low humidities. With reference to these facts I will simply state here—for I wish to refer to it in the conclusion—that a dry atmosphere is invigorating and a moist one debilitating, all other things being equal.

Wind.—To many people much movement of the atmosphere is extremely exasperating, and to find that it has a considerable influence on conduct would not be surprising. Its greatest effect seems to be upon the suicide and the drunkard. For the 3000 suicides studied there was a gradual increase from one-half the normal for movements below 150 miles per day, to more than twice the normal for those of 600 miles. For drunkenness the effect was not so great (minus 23 for calms, plus 30 for hurricanes), but still with the same gradual increase for greater velocities. For the other misdemeanors studied the greatest excesses were for moderate movements of the air,

though always with marked deficiencies for virtual calms. The fact that disorder of an active nature is so markedly below the normal on days when there is scarcely a zephyr is extremely interesting, especially in the light of a study made of the composition of the atmosphere in the crowded portion of some of the large English cities by Dr. J. B. Cohen. He found the volume of CO₂ to be nearly three times as great there on some occasions as at others, or as he found at the same time in the outskirts of the city. He did not refer these fluctuations to different conditions of the wind, though it seems reasonable to do so, and just as reasonable to refer the quieting effects of calms to the debilitating influence of a vitiated atmosphere not properly circulated by the wind.

Character of the Day and Precipitation.—By the Weather Bureau days are characterized as clear if for not more than three-tenths of the period from sunrise to sunset the sun is obscured; as partly cloudy if from four-tenths to seven-tenths (inclusive) are obscured, and as cloudy if more than that amount. Under Precipitation I have contrasted those days upon which there was some rain or snowfall with those upon which there was none, without taking into consideration the amount; in other words, "wet" and "dry" days. A study of these conditions presents some surprises. Of these the most marked is the occurrence of suicide. For New York City at least the classic statement of Montesquieu that "the excessive number of suicides for England is due to its gloomy climate" loses weight. It had long ago been proved that suicide is not excessive in England, and this study would seem to rob the "gloomy" day of its force. The source of my data of suicide was the record of the Coroner where every item was given, and seems reliable. The facts are that self-destruction was 11 per cent. above the normal upon clear days and 17 per cent. above upon dry days, while it was 10 per cent. below upon those characterized as partly cloudy, and 14 per cent. deficient upon those which showed some precipitation, a difference of 21 per cent. between clear and partly cloudy—the most delightful and perhaps the most depressing conditions—and of 34 per cent. between dry and wet, with the greatest number—*mirabile*

dictu—on the least gloomy weather. Cloudy days showed a deficiency of 1 per cent. The influence of days of different character upon the prevalence of drunkenness was surprisingly small. Without exception the other misdemeanors which we are considering were found to be least frequent upon cloudy and wet days, and most frequent upon dry and clear or partly cloudy ones.

The foregoing facts, together with extended studies of the death rate, strength tests made in the gymnasium of Columbia University, the behavior of the insane and a record of 3000 clerical errors made by the employees of the largest banking institutions in the city, seem to warrant the following conclusions:

1. That the weather has a marked influence upon each of the classes of human activity studied.
2. That a weather state which is accompanied by an increase in the number of certain of these activities is accompanied by a decrease in others.
3. That the activities considered may be divided into two classes: those which are due to an excess of bodily energy, and those which are due to a deficiency of it.
4. That activities of these two classes are affected in different ways by weather conditions.

The first and second of these conclusions are based upon the actual facts disclosed by the study and need no further discussion. The third is based upon an analysis of condition and judgment, and might be challenged. To the teacher it seems certain that the disorder in the school room and about the school building is for the most part due to the necessity on the part of the child of working off superfluous energy. The pupils who give the teacher the most trouble are the healthy, energetic, wide-awake ones, who find it necessary to open some motor safety valve, and under the restraint of school discipline this generally means disorder. The boy who rushed down the stairs, two steps at a time, after a long session, was called back, reprimanded, and figured in our data of misconduct, was not an anemic, nor was he necessarily vicious. He had an excess of energy and could not restrain the impulse

to work it off in this way. We can easily imagine the effect of some condition which should increase the energy of 100,000 boys on a given day, and we have the result quantitatively shown by our study. The study of deportment in the penitentiary and asylum for the insane, and that of assault and battery must be placed under the same head. A mere desire to fight, no matter how ardent it be, will get no one into the police court unless it lead to the act, and the latter is determined very largely by the energy at command. The air might be blue with profanity, but on a day when everybody lacked the confidence which comes from the conscious feeling of strength, and did not know that everybody else lacked it, personal combats would be rare, as indeed we have found them to be under devitalizing weather states. On the other hand, certain of the activities which we are considering would increase with a recognized lack of energy. Drunkenness is an example of this. When a man feels that lack of confidence which comes from devitalized bodily condition he takes a "bracer," and for many that means the police court and a place in our records. Suicide comes in this class though showing some peculiar contradictions which will be considered later. The death rate, poor attendance at school, weakness in strength tests in the gymnasium and error in computation in the banks would all be in reverse ratio to vitality, and naturally fall into the class of activities which we are now considering.

But some one asks: Are we to suppose that this world's disorder would be lessened if the sum total of human energy were cut down a few per cent.? Could we then get along with less policemen, and would the teachers' troubles be diminished? Were the Ascetics right? Our answer to that question must in the main be in the affirmative, but there is another side to it, and a very important one. What should we find increased under such devitalized conditions? Death, suicide, drunkenness, muscular strength and mental inexactness. In fact the opposite of all the elements of growth and progress. The world might be less disorderly, but it would be the order of the sanitarium or the hospital ward, and accomplishment would not be one of its elements. Energy, as shown by our

analysis, may be a somewhat dangerous thing to have in excess, but most of us are willing to run the risk incurred for the sake of its usefulness.

If our analysis be a correct one, the weather influences, which we have demonstrated, affect but the metabolic process of life which control the production of available energy, in such a manner that during some meteorological conditions its excess is greater than during others. Those conditions which seem to increase that excess are clear, dry days, moderately high temperature, low humidities, moderate movements of the wind, with somewhat conflicting influence of barometrical conditions. The reverse of these meteorological states seem to lessen the reserve energy. The very marked exception to these statements is the influence of clear, dry days upon the prevalence of suicide. If they are exhilarating, why such an increase in self-destruction? The question is hard to answer, but perhaps the most satisfactory explanation is that of contrast. It is a fact that the suicide chooses the most delightful of all conditions for his exit from this life's sorrows. The clear, dry, bracing days of May and June, the very ones which to a man mentally and physically sound seem most worth living, are the ones of his choice. Is it not that when the March winds blow and the sky is overcast and all nature frowns, that he hopes for a pleasanter to-morrow and with it a brighter mental horizon? Life is still precious, and like the drowning man he clings to the last straw of hope. To-morrow comes with brighter things for everybody but him. Can he hope for a bluer sky or a brighter sun? Yet how different seemed the blue skies and bright suns of other happier days! This time they fail to bring the hoped-for relief. The only solace now is the bullet.

"Comfort? Comfort scorned of devils! this is truth the poet sings,
That a sorrow's crown of sorrow is remembering happier things."

In spite of the fact that whatever the effect of the weather may be, we cannot hope to alter it to suit our desires, the relation which our study shows between cold, windy days and the prevalence of drunkenness is at least suggestive of a line of attack upon the drink problem. Arrests for drunken-

ness were shown to be one-third more than the normal for temperatures near zero, and about the same for very high winds. Impossible as it might be to keep the mercury out of the thermometer bulb or to lessen the violence of the wind, it is not at all impossible to modify the effects of such conditions upon the human body. When a poor fellow is cold, his greatest desire is to get warm. If the windows were only tighter, or if he had a few buckets of coal, he might find comfort, but both better tenements and fuel are beyond his means. A warm overcoat and a pair of mittens would help, but he has none. He can buy temporary comfort and perhaps forgetfulness within his scanty means at the saloon on the corner. He finds both, and figures in our problem. Generations of legislation with liberal applications of prohibition have left our liquor problem as big as ever. To many a temperance agitator the drink habit figures as an indication of viciousness or wicked caprice. To the physical wreck, shivering in his cheerless room or freezing upon the street, it seems a matter of stern necessity. Already the betterment of the social condition has been recognized as a factor in the reduction of crimes of many sorts. Why not strike at one of the roots of this evil and try the application of better heated tenements, of warmer clothing and of more nourishing food?

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